

Powerlink Queensland



Summary of Project Assessment Conclusions Report

17 July 2019

Maintaining reliability of supply at Kamerunga Substation

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Summary

Located approximately 10 kilometres north-west of Cairns, Kamerunga Substation, established in 1976, is a major injection point into the Ergon Energy (part of the Energy Queensland Group) distribution network. Planning studies have confirmed there is an enduring need for the substation to maintain the supply of electricity in the Cairns area.

Both the primary plant and secondary systems at Kamerunga Substation are nearing the end of their technical service lives with identified condition and obsolescence issues. The substation is also susceptible to major flooding events which could result in damage to equipment leading to loss of supply.

The condition of the primary plant and secondary systems at Kamerunga substation, along with the existing flood risk, exposes customers to the risks and consequences of an increasingly unreliable electricity supply.

Under the Electricity Act 1994, Powerlink is required to “operate, maintain (including repair and replace if necessary) and protect its transmission grid to ensure the adequate, economic, reliable and safe transmission of electricity”¹.

Powerlink must therefore address the emerging risks at Kamerunga Substation to ensure customers in the area continue to receive safe, reliable and cost effective electricity services into the future, as well as to meet reliability and service standards within Powerlink’s Transmission Authority² and the National Electricity Rules (the Rules). The investment has been identified as a reliability corrective action.

This Project Assessment Conclusions Report (PACR) represents the final step of the RIT-T process prescribed under the Rules undertaken by Powerlink to address the condition risks arising from the ageing primary plant and secondary systems at Kamerunga Substation. It contains the results of the planning investigation and cost-benefit analysis of credible options. In accordance with the RIT-T, the credible option that minimises the net present value (NPV) of costs is recommended for implementation.

Credible options considered

Powerlink published a Project Specification Consultation Report (PSCR) and a Project Assessment Draft Report (PADR) to Registered Participants, the Australian Energy Market Operator (AEMO) and interested parties in September 2018 and April 2019 respectively, regarding the reliability of supply at the Kamerunga Substation. The PSCR and PADR invited submissions particularly on credible options (network and non-network) to address the risks arising from the condition of the ageing primary plant and secondary systems at Kamerunga.

No submissions were received in response to the PSCR that closed on 21 December 2018 or the PADR that closed on 7 June 2019. As a result, no additional credible options have been identified as a part of this RIT-T consultation.

Powerlink proposed four credible network options to address the identified condition-based and flood risks at Kamerunga Substation.

A summary of the credible options is given in Table 1.

¹ The Electricity Act 1994 (Queensland), Chapter 2, Part 4, S34(1)(a)

² Transmission Authority No. T01/98

Table 1: Summary of credible options

Option	Description	Capital cost (\$m 2018/19)	Weighted NPV (\$m 2018/19)	Ranking
Base Option	Single stage secondary system replacement. Staged AIS primary plant replacement. Flood operable by October 2028	26.70	-22.03	3
Option 1	Single stage secondary system replacement. Single stage AIS primary plant replacement. Flood operable by October 2022	23.20	-22.21	4
Option 2	Single stage secondary system replacement. Single stage GIS primary plant replacement including additional switching functionality. Flood operable by October 2022	24.62	-21.41	1
Option 3	Single stage secondary system replacement. Single stage AIS primary plant replacement including additional switching functionality. Flood operable by October 2022	23.75	-21.45	2

Evaluation and conclusion

The RIT-T requires that the proposed preferred option maximises the present value of net economic benefit, or for a reliability corrective action minimises the cost, to all those who produce, consume and transport electricity in the market.

In accordance with the RIT-T process, the PADR, published in April 2019, made a draft recommendation to implement Option 3 as it:

- satisfies the RIT-T based on the cost benefit analysis (i.e. equal lowest cost in NPV terms with consideration for estimating accuracy)
- utilises existing technology within the Powerlink network, removing the need to acquire new spares and undertake additional training for personnel (compared to Option 2)
- addresses the risk to electricity supply from flood inundation in a single construction phase at the current Kamerunga Substation site by October 2022
- provides increased security of supply through the inclusion of circuit breakers (CBs) on the Woree feeders

Option 3 involves replacing Kamerunga's current primary plant with new AIS (air insulated switchgear) equipment, installing additional circuit breakers for the Woree feeders and the full replacement of all secondary systems in a new building. All primary plant and secondary systems are to be located above the 1 in 200 year flood level. Design work would commence in early 2020, with preparatory construction activities occurring on-site in late 2020. All work would be completed by October 2022. The indicative capital cost of this option is \$23.75 million in 2018/19 prices.

As the outcomes of the economic analysis contained in this PACR remain unchanged from those published in the PADR, the draft recommendation has been adopted without change as the final recommendation, and will now be implemented.



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